

ON THE HISTORY OF PLANT STUDY UPON THE WITWATERSRAND.

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The history of the study of the botany of an area begins with the identification and study of the plants which grow there. Should fate decree that the area should subsequently be industrialised, it is but natural that interest should swing to those plant activities which best serve the needs of the industrial community. The march of events upon the Witwatersrand has followed this course, and it is time that the early botanical events of this region were recorded.

The Witwatersrand area may be variously defined; most simply as the watershed between the Indian Ocean drainage (the Limpopo River) and the Atlantic Ocean drainage (the Vaal River) of southern Africa; most conveniently as the region of the gold mines of the Rand. It is approximately 2,500 sq. miles. Specifically Pretoria in the north, Vereeniging in the south and Heidelberg in the south-east are excluded.

First settled by a European population in the early 40's of the nineteenth century, it remained a sparsely peopled farming area until the finding of gold and the founding of Johannesburg in 1886 (Gray, 1937). Thereafter its history botanically falls into four periods; the Republican period terminating in the Anglo-Boer War; the colonial period terminating in the formation of the Union of South Africa; the early period of Union, culminating in the First World War, and the local development period whose first chapter may be said to have concluded with the Second World War.

The Early Period (pre-1886).

No botanical collector seems to have investigated the Witwatersrand in this period. To the north of the escarpment in the valley of the Jukskei River it seems probable that Capt. Cornwallis Harris hunted in pre-republican days. In 1911 Mr. W. Nelson records the finding of *Bowiea volubilis* Harv. at Blaauwbank near Krugersdorp "35 years before", i.e. in 1876 and there is a specimen collected by him in the herbarium of the Transvaal Museum, Pretoria, labelled "Nelson 514. Yukskyt River. Dec. 1877. Limpopo Sources" of *Potamogeton nodosus* Poir. Since local tradition associates the Witpoortjie stream and falls with the "Limpopo

Sources" this, in all probability, was in our area. Nelson subsequently became a nurseryman operating the Nelsonia Nursery in Booysens, Johannesburg.

The Republican Period.

The early gold discoveries led on to the find of the conglomerates of the Reef, and it soon became clear that gold mining on the Witwatersrand was an enterprise of considerable importance—slowly it began to be realised of some permanence. The early mining town gradually became transformed into the embryo of the city of today and in the process a variety of services grew up, notably those of banking, law and explosives manufacture. I have singled out these three more especially because it is from their ranks that the persons with the interest to make the first serious botanical collections upon the Rand emerged.

The Galpin-Gilfillan Family.

The first Witwatersrand plant of which I can find mention in the literature is an orchid, *Habenaria galpini* Bolus (*H. tetrapetala* var. *galpini* Bolus) described by Dr. H. Bolus in Part I of his first volume of "*Icones Orchidearum Austro-africanarum* t. 17 (1893)". The published notes read, "Transvaal Republic: rocky places near Johannesburg, alt. about 1850 m.; fl. March. E. E. Galpin, 392".

Mr. Galpin was a bank manager from Queenstown who was early transferred to the Transvaal. The story is best described in the words of his son, Mr. E. A. Galpin of Mosdene, Transvaal, who writes to me as follows:—

"Dr. Galpin was a banker by profession and had 40 years' service mostly as manager in various parts of the country, in the Oriental Banking Corporation until it was absorbed by the Bank of Africa, and throughout this Bank's complete history until it was in turn absorbed by the National Bank, retiring from this bank in 1918. Thus a great deal of his collecting was confined entirely to 'leisure' hours. He was always a very busy man with a tremendous capacity for work.

"In 1887 he was manager of the Bank of Africa in Grahamstown and was transferred to their Johannesburg branch as sub-manager, arriving there in 1888. He lived in a tin shack on the present site of the New Law Courts. Owing to the shortage of trained bookkeepers and accountants on the Rand, there was a heavy loss of bank staff to the mining houses, stock-brokers and others, resulting in a constant drain on their supply. This placed a severe burden of work on the remaining staff. The Stock Exchange was very active and as it only closed after normal banking hours, my father as sub-manager was in charge of the scrip and had to

remain in office until dark, clearing the Stock Exchange business. This was all done in cramped temporary quarters. It was only after he had left Johannesburg that the Commissioner Street Central Branch of the Bank was built.

"This meant that he had very little time in which to botanise, and most of his collecting was done on Sunday afternoons along the Parktown and Kensington hills which were then virgin veld. He spent only about six months in Johannesburg and was sent off at a moment's notice to take over the managership of the Barberton branch, where there had been staff trouble.

"In 1892 he married Marie Elizabeth de Jongh, in Pretoria. He had met her in Barberton. She was sister to Jim de Jongh, one of the earliest chairmen of the Stock Exchange and a quondam owner of that well-known residence, "Saratoga Villa", Doornfontein. She was the Marie E. Galpin. Her sister was married to Douglas Flemmer Gilfillan, a well-known Johannesburg lawyer and pioneer and a member of the Reform Committee who was imprisoned after the Jameson Raid. My father interested D. F. Gilfillan in botanical collecting, of which he did quite an appreciable amount in the environs of Johannesburg, sending the material to my father who recorded it as collected by D. F. Gilfillan. Apart from an occasional holiday visit, during which a few hours might be spent in collecting, my father had no further connection with Johannesburg."

Actually Dr. E. E. Galpin's collections upon the Witwatersrand were not numerous, but he was carefully compiling an herbarium in which he preserved, as his son's letter shows, plants collected by D. F. Gilfillan from the Johannesburg area. His wife also collected extensively upon the "ridge above Jeppe's Town". Happily, the Galpin herbarium was donated to the Government after Union and formed the basis of what has now become the National Herbarium at the Union Buildings, Pretoria, and in it Gilfillan's and Mrs. Galpin's plants are preserved.

Mr. Gilfillan is also survived by a son, who has likewise very kindly sent me a letter with pertinent matter.

"Dr. and Mrs. Galpin were my uncle and aunt, my mother being a sister of Mrs. Galpin. My father, who is the Gilfillan you refer to, was always a keen naturalist and his brother-in-law, Dr. Galpin, caused him to become interested in botany.

"My father was a solicitor by profession, and he came through to Barberton in 1888, where he practised as a solicitor. In those days, Johannesburg was thought to be a flash in the pan, and Barberton was believed to be the real goldfield. I think he was only in Barberton for three years, and consequently came to Johannesburg in about 1891 or 1892. At that time Dr. Galpin was either Manager or Accountant at the

Standard Bank, in Johannesburg. My father reached considerable eminence in his profession and was a partner in the firm of Bowman and Gilfillan, which was established before the Boer War. Since his youth my father was always interested in nature including plants and was a keen observer. He became interested in botany due to his friendship for his brother-in-law, Dr. Galpin. They remained life-long friends and went on many botanical expeditions together. I believe that in many respects my father acted as a collector for Dr. Galpin and handed over his specimens for inclusion in Dr. Galpin's collection.

"I do not think that any of his correspondence on botanical matters survives but he kept a diary during the Boer War and ever since, till the date of his death at the age of 83, in 1948. The copies of the diary during the Boer War were lost, but the balance are in my possession. I have only read a few of the more recent sections, but I hope some day to investigate whether anything can be made of it. In his diary he recorded all matters which interested him and I feel sure that he would have recorded his botanical work. As a matter of interest my father was one of the founders of the Wild Life Protection Society and was for many years its President. He was a member of the National Parks Board of Trustees and was a keen ornithologist, on which subject he wrote many papers and articles."

This family group then provides us with the first records of actual Johannesburg plants.

Dr. Paul Conrath.

North-east of Johannesburg there was established very soon after the discovery of the Reef, as a State Monopoly, the "Zuid-Afrikaansche Fabriek voor Ontploffbare Stoffen" which supplied the mines with explosives. To this in 1895 came Paul Conrath as Assistant Manager. By the chance absence of the Manager on leave just before the Anglo-Boer War, he found himself in charge during the occupation of the Transvaal. This may perhaps have led to a period of unexpected leisure: at any rate he then made extensive collections of plants on the factory estate which became in consequence the *locus classicus* for many a species described from the Transvaal. This is indeed fortunate, for the estate of the factory, which is also an explosives magazine, is required by law to be extensive, and has also been enlarged with the progress of the factory, which is now one of the principal production centres of Messrs. African Explosives and Chemical Industries Ltd. This well-known firm has always adopted an enlightened policy towards Wild Life, and the estate is carefully conducted as a Nature Reserve. Conrath left the Transvaal

in 1902, but continued to occupy his leisure with his collections, and to describe new species from his residence in Germany. (Conrath, 1906, 1914.)

Other Items of the Period.

Joubert Park, now buried in the heart of the City, was at that time on its outskirts—a block away from the famous old Wanderers Club which has now been incorporated in Park Station—and its first curator, Mr. R. W. Adlam, was a correspondent of Dr. Medley Wood of Durban and sent him many seeds. Several of his gatherings, some from Joubert Park itself, are likewise preserved in the National Herbarium.

Botany had its commercial aspect on the Rand even at that early date for someone prepared a collection of plants, styled the “East South Central African Herbarium”, which eventually found its way to Kew, as an extract from a letter from Dr. Turrill, Curator of the Kew Herbarium, shows:—

“ . . . Kew purchased the E.S.C.A. (East South Central African) Herbarium from O. Weigel, Leipzig, in February, 1895. It consisted of 614 specimens—‘5 centuries’. Weigel got it from Laidley & Co., about whom I can find nothing. They may have collected the specimens or had them collected. There are 8 specimens of Cyperaceae at Kew from the E.S.C.A. Herbarium, but not one of these bears a date. There are printed and stamped data on the labels plus C. B. Clarke’s determinations. The style of printing suggests a date past the middle of last century . . . ” This note was prepared by E. Nelmes, who conducts the study of the Cyperaceae at the Kew Herbarium, on 7 February, 1951.

By the time the new regime of the Transvaal Colony had become established then, several hundred plants had been collected upon the Witwatersrand and quite a large number had been described as new by various authors.

Other collectors of this period, of whom I can find no further information, were Barker, J. Hall, and a reference to specimens from Max Leitchlin, a well-known nurseryman of Baden-Baden.

The Colonial Period.

With the establishment of Colonial Government, an official botanist was soon appointed, and thus we find Dr. Joseph Burt Davy entering upon the Transvaal scene in 1903. Burt Davy made no very extensive collections upon the Rand but specimens of his gathering in 1905 (Germiston, Observatory Ridge) and 1908 (Ormonde, Booysens) survive. The first Check-list of Transvaal plants (Burt Davy and Pott-Leendertz, 1912) resulted from his enthusiasm, and the first Flora of the Transvaal

(Burt Davy, 1926), unhappily never completed, was due to his subsequent labours at Oxford. Dr. I. B. Pole Evans, fortunately still with us, was soon thereafter appointed mycologist to the Transvaal. His prodigious energy ultimately led to the development of the Division of Plant Industry, and that beautifully illustrated "Flowering Plants of South Africa" in 1921, in which not a few Witwatersrand plants have received notice for the first time. During his period as Chief of the Division, the National Herbarium in its present form took shape. He made personal collections upon the Witwatersrand as early as 1907. However, it was not to the official botanists to whom we owe the first appearance of accounts of Johannesburg's flora.

Capt. H. T. Ommanney collected in the Johannesburg area in 1901/02 and his plants were listed from the British Museum in the "Journal of Botany" for 1902 (Moore, S., 1902). *Ipomaea ommanneyi* Rendle was there described for the first time together with identifications of the collection. Very shortly afterwards the aptly named Dr. R. F. Rand, who had already contributed the first botanical notes concerning the Mashonaland Flora, arrived upon the Witwatersrand, and with Johannesburg as his headquarters, began to study the local flora. His "Wayfaring Notes in the Transvaal" (Rand, R. F., 1903) began to appear in 1903, and contain the first notes on the fertilisation of the flowers of local plants—notes which were not supplemented until the work of Davidson in 1941. In the course of his description, Dr. Rand mentions the tree fern *Cyathea dregei* Kunze along the stream at Witpoortjie. Alas, this plant no longer occurs there or indeed anywhere on the Rand. As far as I know, it, together with the white Arum (*Zantedeschia albomaculata* Baill.), has been exterminated from the local flora during the sixty-four years of the Witwatersrand's industrialisation.

The first plant to bear the name of the City of Johannesburg, *Senecio johannesburgensis* S. Moore (1903), was a gathering of Dr. Rand's No. 1135 "Johannesburg, Klipriviersberg to southward".

Miss Alice Pegler, who contributed so much to our knowledge of the Transkeian flora, visited and collected plants on the Rand in 1904.

Next followed a period when the botanical giants of those days visited the Rand. Dr. Medley Wood, of "Natal Plants" fame was here in 1903, though he did not publish anything on his finds. In 1904 Dr. H. Bolus gathered plants in the south of Johannesburg and his daughter-in-law Dr. L. Bolus has very kindly furnished me with extracts from his diary which are of interest. "I have been looking at Dr. Harry Bolus' diary and find he and his son Frank (who later was my husband) were in Johannesburg on 17th and 19th February, 1904. The entry reads:—'Feb. 17 Wed. arr. Johannesburg, 5689 feet, 11 a.m. Victoria Hotel . . . Walked about the

town—rained aftn., changed our pants . . . Hermann Mundt came to hotel and had a long talk. Feb. 18. Thurs. Went by 'bus to Booysens some 4 miles south of the town—just beyond plantations and enclosures. Gathered on open grassy hills—say "in graminosis apertis ca. 5900 ped." . . . Thunderstorm came on just as we reached the starting place of the 'bus on return—and continued with heavy rain—In the 'bus met one Krohn who . . . told me of Nelson, the collector, who lived still as a nurseryman at Nelsonia—a mile from where we had been, who would, K. said, have been very glad to see me. At Johannesburg still raining . . . and then to our hotel. (On our trip to Booysens lost our best frame with paper.) I have copied the above entries from the diary as giving all the information available in connection with Dr. Bolus' visit to Johannesburg. I do not know of any other visit . . .".

Within a few months the South African Association for the Advancement of Science, holding that year a joint meeting with the British Association for the Advancement of Science, held its business meeting in Johannesburg in July and Dr. R. Marloth, an active member of Council, was present. This visit was commemorated botanically in the well-known *Aloe marlothii* Berg, whose flowers were "collected by Marloth on the Klip River Hills south of Johannesburg" (Reynolds, 1950, p. 480).

At about the same time, and probably in connection with the visit of the British Association, Prof. A. Engler of Berlin visited Johannesburg and made a small collection. This is commemorated in *Eulophia engleri* Rolfe "S. Africa. Transvaal; amongst stones at Klip River Mountains, 1830 m. Engler, 2745." Dr. Engler also honoured the City botanically for his *Hermannia johannesburgiana* Engl. appeared in 1907. Dr. Engler re-visited the City in 1910.

Other notable personalities to gather botanical specimens on the Witwatersrand during this period were Dr. Haagner, Director of the Zoological Gardens, Pretoria, and Mrs. Pott-Leendertz, noted earlier as the co-author of the first Transvaal Check-list, who was the Botanist to the Transvaal Museum. Gatherings were also made by Sampson, Agronomist in the Department of Agriculture on the East Rand, and Preddy in the Germiston area, and more generally by W. McDonald who was Director of Agriculture for the Transvaal, and edited the Transvaal Agricultural Journal.

The 1st Union period (1910-1918).

Apart from the official botanists who of course continued with their duties, working upon the Witwatersrand as occasion demanded, those who made local plant studies included several interesting personalities. It was during this period that Prof. C. E. Moss first arrived upon the Rand,

but as his work properly belongs to the next period we here simply note his arrival. Among those of the community he found were interested in plants, the most famous was perhaps Archdeacon F. A. Rogers, who made such extensive collections all over southern Africa. Rogers started collecting on the Rand in 1915, and in 1918 he and Prof. Moss joined forces and made a very extensive collection together. Prof. Moss' foresight resulted in the preservation of the collections of Mr. G. T. Weeks in what has now become the Moss Herbarium. Mr. Weeks was "Town Botanist", with vaguely defined duties, including the inspection of abattoirs and the judging of animals, but he made fine specimens of local plants and we owe to him, as well as to Adlam mentioned earlier, what we know of the plants that grew wild in Joubert Park in its earlier days.

Another notable personality, happily still with us, who started her botanical collections in those times is Miss Gwen Edwards. Other names of the period are those of McIntosh, Baker, Kling, Hohlen in the City area, Halford at Bedford Farm, Sykes at Natal Spruit, C. H. Fenn at Germiston and in Johannesburg, whilst Mr. F. Frith, the well-known succulent grower, started making his collections, and alas his all too few specimens, in this period.

The Inter-war period. (1918-1939).

Despite the work which had gone before, this is actually the most important period in the growth of the study of plants on the Rand, for it saw the broadening of the field of interest from the purely nomenclatural cataloguing of what grows here to the experimental study of the behaviour of the plants in relation to Agriculture and Industry. During this period Prof. Moss' basic taxonomic work was succeeded by Prof. Phillips' ecological studies of grassland and Mrs. Rebecca Lurie Brown's establishment of the Mycological section of the Timber Research Laboratories.

Prof. C. E. Moss was appointed to the chair at the South African School of Mines and Technology in 1917, then in the process of developing into the University College, Johannesburg, and subsequently into the University of the Witwatersrand. He very soon saw that progress in the development of knowledge of Witwatersrand plants, and of their behaviour, depended upon the compilation of a Flora, with a detailed record of the plants that grew here, and set about the gargantuan task of preparing one, virtually single-handed. For the purpose he began the careful and systematic collection of specimens of all local plants and inspired many others to assist him. During his lifetime some 18,000 specimens were amassed, critically named and arranged, and formed the solid foundation of the present Moss Herbarium. Moss spent most of

his long vacations at Kew critically naming his material, but did not live to complete his self appointed task. The material exists for its completion.

Prof. Moss, who in earlier days had carried out a notable ecological survey of the Peak District in Britain, did not overlook ecological matters and one of his students, Miss Dora Weintroub (1933), fortunately still with us, published the first ecological account of vegetation upon the Rand.

Although collecting extensively over the length and breadth of the Rand, Prof. Moss had his favourite sites, notably the Witpoortjie Gorge and Falls and the Houghton Estate, while he naturally collected regularly at Milner Park, the present site of the University. He died in 1930.

In the Moss Herbarium are preserved many specimens collected by Prof. Moss' students, while at the National Herbarium in Pretoria are many records of his and of others, perhaps stimulated by his enthusiasm. Mr. E. G. Bryant, who conducted a mining and engineering business, and moved to Prieska in 1920, made an extensive collection, principally at Turffontein and on Hospital Hill in 1918-19; Miss Sydney M. Stent brought back an extensive collection of grasses from Henley-on-Klip from a visit in 1922; Mr. and Mrs. R. G. N. Young made collections widely on the Rand commencing about 1926; Miss J. J. Gilmore, of Jeppe High School for Girls, added to the record in 1926-28; Mr. Flugge-Smidt commenced his work at Geduld in 1929 and even Sir Julius Jeppe evinced interest in lawn grass mixtures in 1925.

Two notable overseas visitors at this time were Prof. A. S. Hitchcock, of the United States Department of Agriculture, who made a wide collection of grasses during a brief late winter visit in 1929, and Dr. J. S. Hutchinson of Kew, who made a quick dash towards Johannesburg from Irene during his extensive South African tour in 1929. (Hutchinson, 1946.)

This period also saw the commencement of the notable work of Prof. J. M. Watt who was appointed to the Chair of Pharmacology at the Witwatersrand University in 1920 and published his well-known "The Medicinal and Poisonous Plants of Southern Africa" in 1932.

Prof. Moss was succeeded by Prof. John Phillips who, his interests lying primarily in the ecological sphere of botany, proceeded with the aid of Dr. T. D. Hall, Agricultural Adviser to Messrs African Explosives and Chemical Industries Ltd. to develop the estate Frankenwald, bequeathed by Alfred Beit to the "University of the Transvaal", and which had come into the possession of the Witwatersrand University. By a strange coincidence the estate lies immediately adjacent to the Modderfontein Estate, scene of Dr. Paul Conrath's collections of thirty years before.

Professor Phillips gave one of the earliest accounts of the vegetation

of the Rand (1933), and made Frankenwald a centre of research upon ecological problems, more especially those appertaining to pasture management and conservation. His students hold posts in the field services, from the Cape to the Sudan and the Gold Coast, and his contribution in this way alone is impressive, including as it does the 100 or so students trained in Soil Conservation from the returning veterans of the second World War. Frankenwald remains a notable centre of ecological research, where the biotic community, climatic and edaphic factors, and the impact of fire, grazing, and protection on native grassland are studied, together with the more directly agronomic problems of fertiliser application and chemical weed control, which continue under the aegis of Messrs African Explosives and Chemical Industries Ltd. One of Prof. Phillips' students, Dr. P. E. Glover, contributed the first phenological study of Witwatersrand plants (Glover, 1937). and another, Miss E. Cohen (now Mrs. Gillon), took up the study of the native flora of the Houghton Kopjes, a study which was, in due course of time, to lead to the development of that famous municipal garden "The Wilds".

Meantime the curatorship of the Moss collections passed to Mrs. M. Moss, who valiantly maintained and developed them in the intervals of a heavy teaching programme for the remainder of this period.

While the Moss Herbarium, now in existence, provided a nucleus around which the botanical work of the Witwatersrand proceeded steadily, there were others working independently. Thus on the East Rand Flugge-de Smidt quietly continued with those studies which were to result in "Flowers by the Roadside" in 1947, the Rev. Father Murray collected extensively along the Reef and R. D. Bradfield collected in Benoni in 1934 for the Albany Museum in Grahamstown. Luckily Bradfield's material was sufficient for a duplicate set of specimens to be sent to the National Herbarium where they may now be readily consulted.

Prof. Phillips' activities as a member of the Botanical Survey of South Africa led him to make a large "Botanical Survey Collection", at first maintained separately, but subsequently incorporated in the Moss Herbarium.

Dr. Elaine Young (now Mrs. Laughton), appointed to Prof. Moss' staff in 1920, early set about teaching mycology. Amongst her students was Miss Rebecca Lurie (now Dr. Rebecca Lurie Brown) who, becoming interested in the fungi which caused the decay of wood, soon set in motion those researches, which, with the generous backing of the Chamber of Mines, have led, not only to the substantial saving in costs for the Mining Industry in timber and ventilating apparatus but also to the establishment of the Timber Research Laboratories in Johannesburg. In concert with Miss Dora Weintraub, mentioned earlier, Dr. Brown traced

a sporotrichosis, which threatened to cause considerable unrest, to a fungus and thus averted a strike. So valuable did her work appear to the Chamber of Mines that on her retirement from active participation in the work of the laboratory, the Chamber honoured her service by founding the Rebecca Lurie Brown Prize in Botany at the Witwatersrand University.

Dr. Elaine Young, mentioned earlier, had in collaboration with Miss C. G. Crocker (1933), commenced the study of cytology with an investigation of the chromosomes of *Digitaria* in 1933, while Dr. H. Weinmann's notable researches in plant physiological chemistry commenced towards the close of the period. (Weinmann, 1940.)

This was the stage of development reached with the outbreak of the Second World War, a solid foundation had been laid and the stage had been set for the further specialisation and ramification which were to follow.

ACKNOWLEDGEMENTS.

Much of my information concerning Dr. Paul Conrath I owe to Mr. D. Allen of Johannesburg, and I have to record with gratitude the help of Mrs. M. Moss, lately senior lecturer in Botany of the Witwatersrand University, and of Miss R. H. Gunn, Librarian, Division of Botany, Department of Agriculture, in compiling these notes.

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